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Publications of the Environmental Health Program: 1980–1990

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PREFACE

This bibliography contains publications resulting from research supported by the NASA Environmental Health Program during the years 1980-1990. Portions of this ten-year compilation have been published previously as part of a series of bibliographies of space biomedical research. Previous editions in this series cover the years 1980-1982 (NASA CR 3587), 1982-1983 (NASA CR 3739), 1983-1984 (NASA CR 3860), 1984-1986 (NASA CR 4184), and 1987-1988 (NASA CR 187840).

This bibliography is divided into four sections: Barophysiology, Microbiology, Toxicology, and General Environmental Health. NASA-funded investigators whose work resulted in the publication are identified by an asterisk. A principal investigator index is included in the bibliography, as well as a list of investigators and their affiliations.

As part of our continuing interaction with the scientific and professional community, we are pleased to present this bibliography in an effort to stimulate an exchange of information and ideas among scientists working in this program.

We would like to thank the investigators for their cooperation in submitting lists of their publications. We would also like to thank Audrey Brown for her technical expertise in the compilation of this bibliography.

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INTRODUCTION

The Environmental Health Program is part of the Life Sciences Division of NASA's Office of Space Science and Applications. Space life sciences research was initiated in 1960 with the goal of enabling human survival in space. Now, in the late 20th century, the program is evolving to ensure human health and productivity on space missions: on the Space Shuttle in the 1990s, then on Space Station Freedom, and ultimately on the Moon and missions to Mars.

The health and well-being of crews in the spacecraft environment depend on proper atmospheric composition and pressure and an environment free from accumulated air- and waterborne gaseous, particulate, and microbial toxicants and contaminants. The goals of the Environmental Health Program are to utilize ground-based studies to understand the effects of the spacecraft and extravehicular activity (EVA) environments on humans and other organisms; to specify, measure, and control these environments; and to develop countermeasures where necessary to optimize crew health, safety, and productivity. The current program strives to achieve these goals by conducting research to define microbiological and toxicological standards and barophysiological protocols, and developing advanced environmental monitoring technology.

The Environmental Health Program encompasses three disciplines: barophysiology, toxicology, and microbiology. Barophysiology includes understanding the biomedical considerations related to atmospheric composition and pressure of the space habitat; development of acceptable and appropriate ranges of gas composition, pressure, temperature, and humidity; defining models to predict decompression sickness; developing training protocols; and developing countermeasures for any adverse medical conditions that arise as a result of changes in atmospheric composition or pressure. Toxicology involves investigating the mechanisms of chemical poisoning at the molecular level; understanding toxicity and risk assessments, physiochemical properties, exposure limits, and contingency procedures; and developing procedures or methods to prevent harmful exposure to airborne chemicals. Microbiology involves establishing microbial standards for air, water, food, surfaces, and experimental animals; developing monitoring techniques; understanding the effects of spaceflight on microbial functions, population dynamics, and host-microbe interactions; and investigating the role of spaceflight stressors on the human immune system with emphasis on the risk of infectious disease due to common and environmental microorganisms.

Janis H. Stoklosa, Ph.D
Manager, Environmental Health Program

BAROPHYSIOLOGY

- Adams*, J.D.
Review of space cabin and EVA suit environmental research at the School of Aerospace Medicine:
Three decades (Abstract).
In: *Space Life Sciences Symposium: Three Decades of Life Science Research in Space*,
Washington, DC, June 21-26, 1987, p. 59. (GWU 9949)
- Adams*, J.D.; Dixon, G.A.; Harvey, W.T.
Bends susceptibility (Abstract).
Aviation, Space, and Environmental Medicine 55(5): 452, 1984. (GWU 5650)
- Adams*, J.D.; Dixon, G.A.; Olson, R.M.; Bassett, B.E.; Fitzpatrick, E.L.
Preventing of bends during space shuttle EVAs using stage decompression.
In: *Preprints of 1981 Annual Scientific Meeting, Aerospace Medical Association*, San Antonio,
TX, May 4-7, 1981. Washington, DC: Aerospace Medical Association, p. 55-56, 1981.
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Advanced warning of the potential risk of developing bends and screening of bends prone
individuals.
In: *Preprints of 1980 Annual Scientific Meeting, Aerospace Medical Association*, Anaheim, CA,
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- Barrow, R.E.; Hills*, B.A.
Properties of four lung surfactants and their mixtures under physiological conditions.
Respiration Physiology 51: 79-93, 1983. (GWU 4302)
- Bueker, P.A. (Bungo, M.W. = P.I.)
*Special Report on the Data Collection Programs for the Ground Based Nitrogen Washout
Experiment. Volume 2: Detailed Program Descriptions, Listings, Examples and Hardware
Specifications*. Houston, TX: Technology Incorporated, 209 p., 1982. (NASA-CR-167737)
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Positive end-expiratory pressure (PEEP) and venous air embolism (Abstract).
Federation Proceedings 46: 1303, 1987. (GWU 10852)
- Butler*, B.; Luehr, S.; Katz, J.
Longevity of pulmonary vascular bubbles following venous air embolism (Abstract).
Abstract of paper presented at the Proceedings of the Ninth World Congress of Anesthesiology,
1988, 1 p. (GWU 10854)
- Butler*, B.D.
Lysophosphatidylcholine induced changes in surface properties of rat bronchoalveolar lavage
(Abstract).
FASEB Journal 4(3): A1185, 1990. (GWU 12163)
- Butler*, B.D.; Allen, S.J.; Laine, G.A.
Pulmonary edema with venous gas emboli: No evidence for microvascular permeability change
(Abstract).
Undersea Biomedical Research 17: 71, 1990. (GWU 13514)

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Pulmonary hemodynamics, extravascular lung water and residual gas bubbles following low dose venous gas embolism in dogs.
Aviation, Space, and Environmental Medicine 60(12): 1178-1182, 1989. (GWU 13393)

Butler*, B.D.; Conkin, J.; Luehr, S.
Repetitive versus continuous venous air embolism in dogs: Effects on pulmonary hemodynamics, extravascular lung water and bubble longevity (Abstract).
Undersea Biomedical Research 15: 18, 1988. (GWU 10139)

Butler*, B.D.; Davies, I.; Drake, R.E.
Airway instillation of lysophosphatidylcholine and its effects on filtration coefficient and critical microvascular pressure (Abstract).
FASEB Journal 3(4): A372, 1989. (GWU 9864)

Butler*, B.D.; Davies, I.; Drake, R.E.
Changes in alveolar lysophosphatidylcholine (LPC) and extravascular lung water after ischemia/reperfusion (I/R) (Abstract).
Physiologist 31(4): A92, 1988. (GWU 10808)

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Effect of lysophosphatidylcholine on the filtration coefficient in intact dog lungs.
American Journal of Physiology 257: H1466-H1470, 1989. (GWU 13479)

Butler*, B.D.; Davies, I.; Drake, R.E.
Lysophosphatidylcholine effects of lung fluid balance in dogs (Abstract).
In: *Proceedings of the 7th International Symposium on Surfactants in Solution*, Ottawa, Canada, 1988, p. 145. (GWU 10850)

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Cardiovascular effects and filtration threshold for pulmonary air embolism (Abstract).
Federation Proceedings 42(3): 489, 1983. (GWU 4825)

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Role of lung surfactant in cerebral decompression sickness.
Aviation, Space, and Environmental Medicine 54(1): 11-15, 1983. (GWU 4501)

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Transpulmonary passage of venous air emboli.
Journal of Applied Physiology 59(2): 543-547, 1985. (GWU 7092)

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Pulmonary hemodynamic factors leading to arterial gas embolism of venous origin (Abstract).
Undersea Biomedical Research 15: 25, 1988. (GWU 10140)

Butler*, B.D.; Katz, J.
Vascular pressures and passage of gas emboli through the pulmonary circulation.
Undersea Biomedical Research 15(3): 203-209, 1988. (GWU 10859)

Butler*, B.D.; Katz, J.
Venous gas embolism (Abstract).
In: *Space Life Sciences Symposium: Three Decades of Life Science Research in Space*, Washington, DC, June 21-26, 1987, p. 148-149. (GWU 9955)

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Cerebral decompression sickness: Bubble distribution in dogs in the Trendelenberg position (Abstract).
Undersea Biomedical Research 14: 15, 1987. (GWU 10851)
- Butler*, B.D.; Laine, G.A.; Leiman, B.C.; Warters, D.; Kurusz, M.; Sutton, T.; Katz, J.
Effect of the Trendelenburg position on the distribution of arterial air emboli in dogs.
Annals of Thoracic Surgery 45(2): 198-202, 1988. (GWU 10856)
- Butler*, B.D.; Luehr, S.; Katz, J.
Influence of oxygen ventilation on survival of air emboli in the pulmonary vasculature (Abstract).
FASEB Journal 2(6): A1721, 1988. (GWU 9309)
- Butler*, B.D.; Luehr, S.; Katz, J.
Venous gas embolism: Time course of residual pulmonary intravascular bubbles.
Undersea Biomedical Research 16(1): 21-29, 1989. (GWU 13481)
- Butler*, B.D.; Robinson, R.
Digitized ultrasonic bubble signals as a visual adjunct to bubble scoring during decompression for EVA simulation (Abstract).
Aviation, Space, and Environmental Medicine 61: A40, 1990. (GWU 13513)
- Butler*, B.D.; Robinson, R.; Sutton, T.
Venous bubble detection with decompression: Computer assisted visual and audio monitoring (Abstract).
Undersea Biomedical Research 17: 34, 1990. (GWU 13512)
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The influence of sex on dysbaric disorders (Abstract).
Aviation, Space, and Environmental Medicine 56(5): 484, 1985. (GWU 7437)
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Altitude induced reversible alterations of the blood-brain and blood-lung barriers (Abstract).
Aviation, Space, and Environmental Medicine 59(5): 471, 1988. (GWU 9913)
- Chryssanthou*, C.; Kircikoglu, H.; Strugar, J.
Increase of plasma renin activity in male and female rabbits subjected to dysbaric conditions.
Aviation, Space, and Environmental Medicine 56(5): 427-430, 1985. (GWU 7439)
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Increase of plasma renin activity in rabbits subjected to dysbaric conditions (Abstract).
Aviation, Space, and Environmental Medicine 55(5): 452, 1984. (GWU 7438)
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Increase in blood-brain barrier permeability by altitude decompression.
Aviation, Space, and Environmental Medicine 58(11): 1082-1086, 1987. (GWU 8660)
- Chryssanthou*, C.; Stenger, R.J.; Goldstein, G.
Blood-brain barrier alteration by altitude decompression (Abstract).
Aviation, Space, and Environmental Medicine 57(5): 490, 1986. (GWU 8032)

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Dysbaric disorders induced by altitude decompression (Abstract).
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Undersea Biomedical Research 17(Suppl.): 25, 1990. (GWU 13524)

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Principles of oxygen tolerance extension defined in the rat by intermittent oxygen exposure at 2.0
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Undersea Biomedical Research 16(Suppl.): 99, 1990. (GWU 14160)

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Empirical models for use in designing decompression procedures for space operations (Abstract).
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Conkin, J.; Waligora*, J.M.; Horrigan*, D.J., Jr.; Hadley, A.T., III
Comparison of venous gas emboli and decompression sickness incidence in exercising subjects
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Aviation, Space, and Environmental Medicine 55(5): 452, 1984. (GWU 5696)

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Journal of Applied Physiology 62(2): 533-538, 1987. (GWU 13712)
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Undersea Biomedical Research 16(Suppl.): 93-94, 1989. (GWU 14163)
- Gelfand, R.; Clark, J.M.; Lambertsen*, C.J.
Ventilatory response to hypoxia is preserved following prolonged hyperbaric hyperoxia at 1.5, 2.0, and 2.5 ATA in man (Predictive Studies V) (Abstract).
Undersea Biomedical Research 17(Suppl.): 163, 1990. (GWU 13521)
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Effects on respiratory homeostasis of prolonged, continuous hyperoxia at 1.5 to 3.0 ATA in man in Predictive Studies V.
In: *Underwater and Hyperbaric Physiology IX* (Bove, A.A., Bachrach, A.J., Greenbaum, L.J., Eds.). Bethesda, MD: Undersea and Hyperbaric Medical Society, p. 751-761, 1987. (GWU 13785)

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FASEB Journal 2(6): A1508, 1988. (GWU 9316)

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Undersea Biomedical Research 17(Suppl.): 157, 1990. (GWU 13523)

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Undersea Biomedical Research 17(Suppl.): 95, 1990. (GWU 13525)

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The relation of whole-body nitrogen elimination during oxygen breathing to the acquisition of decompression sickness protection (Abstract).
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In: *The Physiological Basis of Decompression* (Vann, R.D., Ed.). Bethesda, MD: Undersea and Hyperbaric Medical Society, p. 147-151, 1989. (GWU 9880)

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Journal of Physiology 359: 65-79, 1985. (GWU 7135)

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Analysis of eustachian surfactant and its function as a release agent.
Archives of Otolaryngology 110(1): 3-9, 1984. (GWU 5183)

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Arrest of metastatic cells: Agents promoting and inhibiting instant non-specific adhesion by fibronectin.
Anticancer Research 5(3): 287-291, 1985. (GWU 7136)

Hills*, B.A.
Compatible atmospheres for a space suit, space station, and shuttle based on physiological principles.
Aviation, Space, and Environmental Medicine 56(11): 1052-1058, 1985. (GWU 7138)

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Contact-angle hysteresis induced by pulmonary surfactants.
Journal of Applied Physiology: Respiratory, Environmental and Exercise Physiology 54:420-426, 1983. (GWU 4116)

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Archives of Otolaryngology 110(12): 779-782, 1984. (GWU 7137)

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A surface engine phenomenon induced by lung surfactants (Abstract).
Federation Proceedings 41(4): 998, 1982. (GWU 4511)

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Air embolism: Possible role of surfactant on recompression.
Journal of Applied Physiology: Respiratory, Environmental and Exercise Physiology 52(1): 119-123, 1982. (GWU 4583)

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An 'engine' phenomenon displayed by monolayers of a pulmonary surfactant cycled to steady state.
Physics in Medicine and Biology 29(11): 1399-1408, 1984. (GWU 7139)

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Role of surfactant in the lung and other organs.
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Phospholipids identified on the pericardium and their ability to impart boundary lubrication.
Annals of Biomedical Engineering 13(6): 573-586, 1985. (GWU 7140)

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Surfactants identified in lung lymph and their ability to act as adhesives.
Journal of Applied Physiology 58(2): 514-520, 1985. (GWU 7674)

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Undersea Biomedical Research 9: 185-201, 1982. (GWU 4228)

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In: *Flying After Diving* (Sheffield, P.J., Ed.). Bethesda, MD: Undersea and Hyperbaric Medical Society, 1989.

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Selection of an emergency back-up pressure for an 8.3 psi space suit (Abstract).

Aviation, Space, and Environmental Medicine 61(5): 471, 1990. (GWU 13167)

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Aviation, Space, and Environmental Medicine 57(5): 511, 1986. (GWU 8029)

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Results of metabolic rate assessment during shuttle extravehicular activities (Abstract).

Aviation, Space, and Environmental Medicine 58(5): 483, 1987. (GWU 8820)

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Doppler measurements of intravenous gas bubbles during six hours of exercise at space suit pressures (Abstract).

Aviation, Space, and Environmental Medicine 55(5): 451, 1984. (GWU 5649)

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Aviation, Space, and Environmental Medicine 60(5): 488, 1989. (GWU 14371)

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16. Abstract A 10-year cumulative bibliography of publications resulting from research supported by the Environmental Health Program of the Life Sciences Division of NASA is provided. The goals of this program are to utilize ground-based studies to understand the effects of the spacecraft and EVA environments on humans and other organisms; to specify, measure and control these environments; and to develop countermeasures where necessary to optimize crew health, safety, and productivity. Primary subjects encompassed by this bibliography are barophysiology, toxicology, and microbiology. Principal Investigators whose research tasks resulted in publication are identified by asterisk.			
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